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ABSTRACT

Social studies education would benefit greatly if curriculum development was more directly linked to developmental child psychology based on Piagetian models of concrete operations. A science education program based on this model of concrete experiences is cited and positive results for both students and teachers are noted. Two social studies curriculum programs ("Man: A Course of Study" and "The Family of Man") and several Piagetian-based research studies provide positive evidence that all instruction should employ concrete operations with some exposure to formal operations, but not the reverse, a design found commonly in social studies textbooks. The cited models suggest a key for the development of social studies methods textbooks. Five ways that the social studies could benefit from Piagetian-based research are described including relating materials to cognitive stage development, preservice and inservice teaching training, federal assistance application, more concrete/manipulative material awareness and implementation, and more concentrated efforts to encourage the application of Piaget's developmental psychology by creative social studies educators. (TRS)

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LOGICAL REASONING PATTERNS IN STUDENTS AND SOCIAL STUDIES INSTRUCTION

BY

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Logical Reasoning Patterns in Students

and Social Studies Instruction

by

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The social studies curriculum has received some attention for its work in the area of values development. Lawrence Kohlberg has taken a systematic approach to curriculum development based upon Piaget's research in moral development. However, most attempts at the development of social studies material have not succeeded in linking developmental child psychology ala Piaget, to curriculum development. Programs like MACOS (1970), TABA (1972), MATCH (1969), FOM (1972), People and Technology (1973) have had some design related to developmental psychology.

Piaget's research as well as Herbert Thelen's and John Dewey's would support meaningful learning activities as initiated from within the learner, and Piaget has had his greatest impact upon learning by providing students with more concrete experiences and with manipulative materials. If we can look at the research which has accumulated from the National Science Foundation's elementary school science programs, one would find interesting, positive results related to student achievement, something which is difficult to document in most innovative programs. The SCIS (1971) program based upon piaget's research on cognitive development in children has yielded the following results:

1. The results of the study indicate that the SCIS curriculum was superior to a textbook program for developing the six processes of scientific investigation (observation, classification, measurement, experimentation, interpretation, prediction).

2. There was an observable difference in the manner in which both groups of subjects approached the solution to the process-oriented tasks. The SCIS students were more aggressive in their approach.By contrast, many students in the textbook group did not touch the materials while attempting a solution. The entire textbook group was more passive.

3. SCIS students were more diverse, persistent, and creative in their experimental designs, more capable of diverse mental operations-problem solving skills.

4. On conservation reasoning tasks, the SCIS group outperformed the control group in total gains between pre and post-tests. Also noteworthy, the first year units helped children, lacking preschool education, to gain in conservation skills. Hence, there might be a correlation between progress in first grade and conservation ability.

5. Related to reading and reading readiness, the students in the SCIS group showed greater gain in 5 of the 6 reading subtest areas (word meaning, listening, matching, alphabet, numbers). Maybe, to best teach beginning reading, first teach thinking as represented by conversation reasoning.

6. Achievement in reading, mathematics, and social studies showed the experiemental SCIS group outperforming the control group on every subtest of the Stanford Achievement Series (mathematical applications, social studies skills, paragraph meaning). Apparently, children who have had experience with SCIS units, tend to utilize higher power thinking skills.

7. Teacher behavior has also shown improvement. SCIS teachers involved their children in twice as many science experiences as did non-SCIS teachers. Teachers asked more questions which required a higher level of thought than did non-SCIS teachers, who asked more recall and recognition questions.

Other studies relating to improved teacher behavior and student performance have been summarized in the ERIC Center for Science, Mathematics, and Environmental Education. The possible effects upon improving social studies education for students can be as far reaching.

Now, let us focus our attention on the limited research on social studies curriculum programs and Piagetian-based research studies. Man: a Course of Study (MACOS) and the Family of Man (FOM) have had very extensive field-tested and research-based program development, something which is generally rare. And we are talking about innovative programs which command less than 15 percent of the commerical market.

Research-based Curriculum Materials

MACOS (1970) results based upon Jerome Bruner's research has shown:

1. Children acquired and retained a significant amount of information and developed an increased ability to reason.

2. Boy-girl differences associated with school work disappeared.

3. Individual differences are not associated with student's intelligence or previous knowledge of the area. Students with poor academic background gained in learning and mastering over the ideas and concepts as much as those whose beginning positions were much stronger. The most knowledgeable students also made equally larger gains. Neither group sacrificed at the expense of the other.

4. Reinforcement of an idea through various media and creative exercises resulted in substantial gain in learning. Active involvement in projects became powerful motivation for learning the abstract.

5. Group participation and interaction were increased and rated highly by students. Communication skills were major growth areas in children as viewed by teachers.

6. Positive changes in teaching style were attributable to the program.

The Family of Man (1974) results have shown a strong relationship between concrete, manipulative materials for children and increased pupil achievement:

1. Children noticed significantly more differences in environmental use and similarities between themselves and people of other cultures.

2. Children had a more favorable view toward foreigh people and cultures, also toward all people.

3. The FOM students scored better on the Primary Social Studies Test and had more positive attitudes toward social studies and school.

4. Children using the materials scored significantly higher on SRA/ETS instruments than national norms, with a cumulative effect in later grades.

5. Lower scoring children had more ascendency over norms than high scoring children, with all grade levels in the program scoring significantly higher.

6. A cost analysis comparing FOM to seven other textbook programs showed the first year and fifth year cost under all other programs.

Piagetian-Based Research Studies

Irving E. Sigel (1966) seems to be one of the few researchers looking at this area in relation to social studies instruction. He has found the following relationship in social studies to Piaget's research:

1. The process of classification can be the focus of social science curriculum relating to Piaget's theory of cognitive development.

2. The cognitive stage of concrete operations, as defined by Piaget, should focus elementary school social studies programs and materials on concrete objects.

3. His research efforts have shown that using a discovery-type approach guided by the teacher, as better than other methods.

4. If children at an early age are exposed to experiences that broaden categorization, it would facilitate thinking in more original ways.

Roy Hallam (1976) found the following to be evidenced in the teaching of history:

1. Piaget's level of formal operations, when subjects are able to reason by implication at an abstract level and to postulate hypotheses, was reached after a chronological age of 16.2-16.6 years. Therefore, formal thinking in history develops relatively late in the secondary school. Research work indicates that it is useless to present abstract material to pupils before they are ready to assimilate it.

2. Piaget recommends discussion, especially with one's peers, as a major educational method for improving thinking. Divide your class into small groups of 4-5 children for discussions.

3. Cooperation is necessary for intellectual and moral development.

4. Ancient history is more comprehendable for students because it can be taught as a concrete subject using homes, pyramids, calendars, food, clothing, diagrams, maps, model building, and visits.

The Piagetian stages of intellectual development are defined and should be related to curriculum development:

Sensory-Motor Stage: birth to 2 years

Coordination of perceptual-motor functions occurs before formalized school.

Preoperational Stage: Approximate ages 2-7

Preschool and primary education
Self-centered pupil orientation
Unconcerned about logic
Cannot classify
Play and reality the sam
Cannot Conserve

Concrete Operations: Approximate ages 7-11

Oriented toward concrete examples and objects
Elementary school education
Conservation patterns develop
Believe what they see only
Classification begins
Beginnings of logical thought

Formal Operations: Approximate ages 11-15 - adult
Abstract thinking
Forms hypotheses
Predicts
Concrete experiences not always necessary
Combines mental operations

These stages develop in a sequential order and the child must proceed through each stage in order to achieve logical thinking. Most elementary school students operate on the concrete operations stage and should be exposed to concrete situations. Studies (1979, Gabel) have shown that many secondary and college students do not operate on the formal operations stage. This provides more evidence that all instruction should be using concrete operations with some exposure to formal operations, but not the reverse, as is found most commonly in textbooks (Karplus, 1977).

Curriculum development in the form of a Piagetian-model for teacher training was developed by Richard W. Copeland in the form of a methods textbook for preservice and in-service teachers. He used the teaching implications of Piaget's research in developing the text on How Children Learn Mathematics (1974). Many mathemtical concepts are introduced to elementary school children too soon and in an abstract fashion according to Piaget's developmental levels. Copeland's

approach is to look at a different way to introduce these concepts, more concretely according to Piaget. Ronald Good (1977) has completed a Piagetian-based elementary school science methods book called How Children Learn Science. Robert Karplus (1977) has developed a science workshop text which familiarizes teachers with Piagetian stages of concrete and formal thinking using science textbook instruction as its vehicle. These models could hold a key to developing social studies methods textbooks for teachers and might eliminate some failure in schools because of the abstract nature of reading, math, and social studies textbook programs.

THE NEED

It would seem to this writer that social studies education would benefit greatly from attention to Piagetian-based research in the following ways:

1. Development and dissemination of on-going and future curriculum programs relating student materials to Piaget's cognitive stages of development, e.g. MACOS, FOM.

2. Development and dissemination of Piagetian-based social studies methods textbooks for preservice and inservice teacher training.

3. Application for Federal projects to assist in these above developmental areas, e.g. NSF, NIE.

4. Increased awareness and implementation in schools of Piagetian-based programs to assist student learning through the use of more concrete and manipulative materials.

5. A more concentrated effort by the creative minds in social studies education to better relate Piaget's developmental psychology to learning materials.

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